Special Flood Hazard Information Report

KENNEBEC RIVER

Augusta, Hallowell, Chelsea, Farmingdale, Randolph, Gardiner,

Pittston, Richmond, Bowdoinham, & Dresden,

MAINE

PREPARED BY THE DEPARTMENT OF THE ARMY, NEW ENGLAND DIVISION,
CORPS OF ENGINEERS, WALTHAM, MASSACHUSETTS

NOVEMBER 1975

SPECIAL FLOOD HAZARD INFORMATION

KENNEBEC RIVER
DRESDEN, BOWDOINHAM, RICHMOND
PITTSTON, GARDINER, RANDOLPH
FARMINGDALE, CHELSEA, HALLOWELL
AND AUGUSTA, MAINE

Prepared for
Southern Kennebec Valley Regional Planning Commission
By
Department of the Army, New England Division
Corps of Engineers, Waltham, Massachusetts

NOVEMBER 1975

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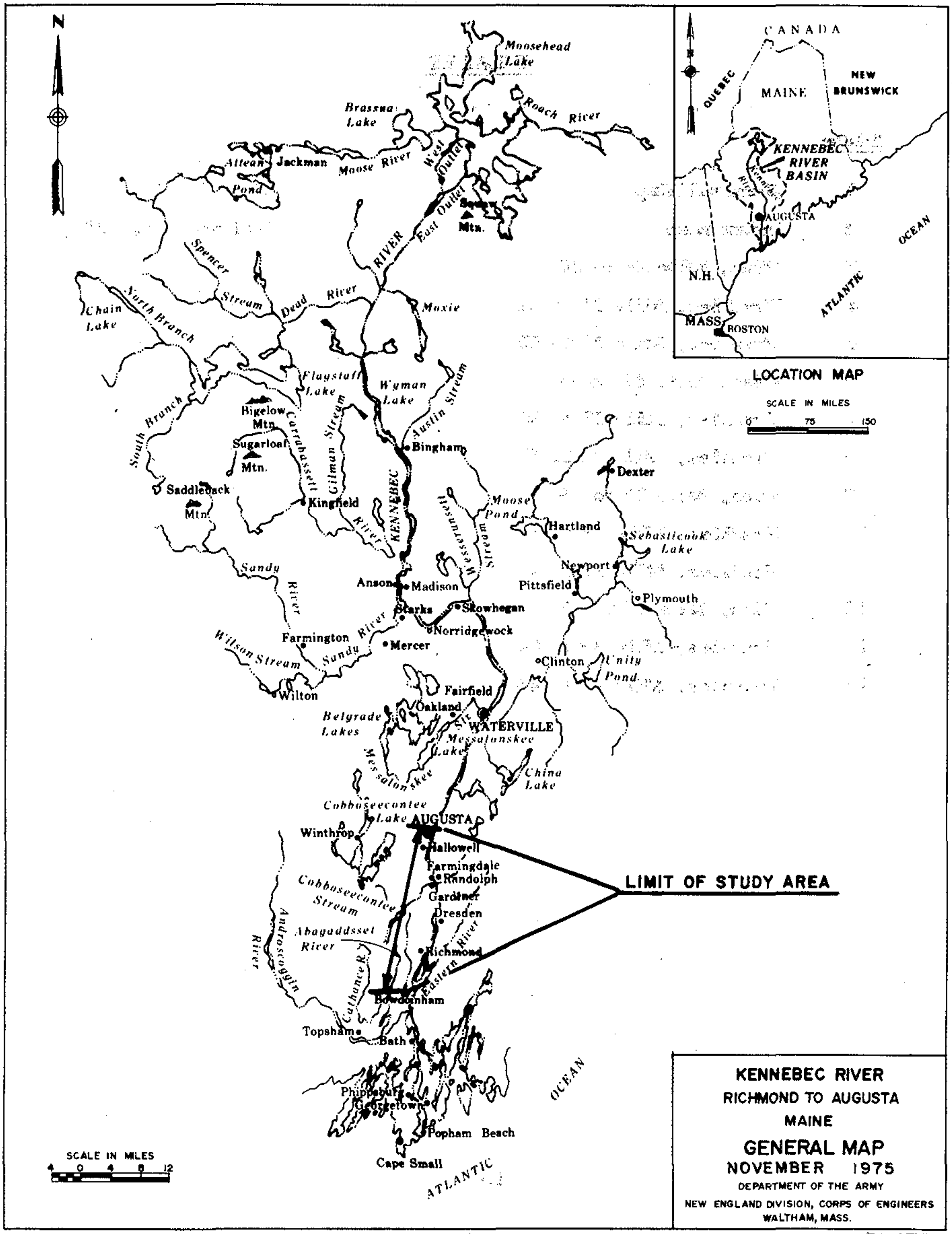
N
Moosehead Lake
Brassua Lake
Roach River
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Jackman
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West Outlet
East Outlet
Squaw Mtn.
RIVER
Spencer Stream
Dead River
Chain Lake
North Branch
Moxie
Flagstaff Lake
Wyman Lake
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Georgetown
Popham Beach
Cape Small
OCEAN
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4 0 4 8 12
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QUEBEC
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NOVEMBER 1975
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

PLATE I

SPECIAL FLOOD HAZARD INFORMATION
Kennebec River
Maine

INTRODUCTION

This is a special report which relates to the flood situation along the Kennebec River from the Dresden-Bowdoinham town line to Augusta. It was prepared at the request of the Southern Kennebec Valley Regional Planning Commission with the approval of the Maine Soil and Water Conservation Commission.

This report covers approximately 23 miles upstream from the Dresden-Bowdoinham town line to the Cushnoc Dam in Augusta. Although large floods have occurred in the past, studies indicate that even larger floods are possible. In order to minimize the vulnerability of current development to flood damage, maps and profiles indicating the extent of flooding which might occur in the future have been included in this report.

With this information, future developments may be planned and existing buildings may be flood-proofed to the appropriate level to avoid flood damage.

BACKGROUND INFORMATION

The Kennebec River has been a means of transportation and a source of food for many years. Swan Island, just upstream from Merrymeeting Bay, was the center of Indian life in the basin at the time when the first attempt at colonization in New England was made by the British at the unsuccessful Popham Colony in 1607. This settlement was at Hunniwell's Point at the end of the Sagadahoc

Peninsula. Immediately following the grant of the Kennebec Patent in 1628-1629, men from the Plymouth Colony of Massachusetts established a trading post at a site known to the Indians as Cushnoc in what is now the city of Augusta. This venture proved to be very successful and it is said that the Pilgrims repaid their debts to the Merchant Adventurers of London, financiers of the Mayflower expedition, with furs brought from the Kennebec. Upon the outbreak of the Indian wars, the post at Cushnoc was abandoned after over 32 years of operation. In 1646, a French mission was established at the Abnaki Indian village of Nanrantsouak or Norridgewock about 43 miles upstream from Augusta. This village and mission were destroyed by an expedition from Massachusetts in 1724. In 1754, during the last of the wars with the French, three forts were constructed along the lower Kennebec River at the present-day sites of Winslow, Augusta and Dresden. Following the capture of Quebec by the British in 1759, and the securing of peace with the French and Indians, settlements advanced rapidly up the Kennebec River Valley. By 1775, the first year of the American Revolution, there were white settlements as far upstream as Norridgewock. Bingham, about 30 miles above Norridgewock, was settled in 1785 and in 1822 a settlement was established about 20 miles further upstream at The Forks.

The Stream and Its Valley

The Kennebec River Basin is located entirely within the State of Maine, between the Androscoggin River Basin to the west and the watershed of the Penobscot River to the north and east. The northwestern limit of the watershed forms a part of the international boundary between the United States and Canada. The basin above Abagadasset Point in the town of Bowdoinham has a maximum length in a north-south direction of about 132 miles, a maximum width of about 77 miles, and a total area of approximately 5,870 square miles which is equivalent to about one-fifth of the total area of the State.

The Kennebec River rises in Moosehead Lake and flows southerly 145 miles to the head of Merrymeeting Bay at Abagadasset Point, about seven miles above Bath. Geographically, the river continues to flow south to Hunniwell Point, about 19.5 miles below Abagadasset Point, then one mile further to its mouth at the Atlantic Ocean. However, the lower 20.5 miles of the river are considered to be in the Maine Coastal Streams Area and are not included in this report on the Kennebec River.

The Kennebec River is tidal as far as Augusta, 25 miles above Abagadasset Point. Between Moosehead Lake, at an elevation of about 1029 feet, mean sea level, and mean tide at Augusta, the river falls about 1026 feet in a distance of 120 miles or at an average gradient of 8.5 feet per mile.

Cobbosseecontee Stream, a major tributary to the Kennebec River in the study area, is fed by a group of lakes and ponds located in the southern part of the Kennebec River Basin, 10 to 12 miles west and southwest of Augusta. Included in the headwater lakes and ponds are Torsey, Maranacook, Annabessacook, Tacoma, and Cobbosseecontee Lakes, and Sand, Carlton, Upper Narrows, and Lower Narrows Ponds. From the outlet of Cobbosseecontee Lake, this tributary flows southerly and then easterly for nine miles to Pleasant Pond and then northeasterly eight miles to its mouth at the Kennebec River at Gardiner. The total fall in this stream, between the level of Cobbosseecontee Lake and mean tide at Gardiner, is approximately 163 feet. The total drainage area of the stream and its headwater lakes is 240 square miles. (See Table 1).

TABLE 1

DRAINAGE AREAS

Location	Sq. Miles
Upper Limit of Study (Cushnoc Dam)	5,470
Cobbosseecontee Stream	240
Local Drainage Area (excluding Cobbosseecontee Stream)	186
Lower Limit of Study (Dresden-Bowdoinham TOWN LINE)	5,868

DISCHARGE RECORDS

United States Geological Survey (USGS) has recorded flows in the Kennebec River Basin at various locations since 1890. Records of flows have been maintained at Waterville since 1892. The dates and magnitude of the largest floods of record at Waterville (DA=4,200 square miles) are listed in Table 2.

TABLE 2

KENNEBEC RIVER
DISCHARGE RECORDS AT WATERVILLE

Date	Peak Discharge (cfs)
December 1901	157,000
March 1936	154,000
May 1923	135,000
December 1973	132,000 (est)

At Augusta (DA = 5,470 square miles) the estimated peak discharge of the March 1936 flood was 160,000 cfs. It is noted that even though the 1901 discharge was the greatest on record at Waterville, there are no records of it being a major flood in the study area.

PAST FLOODS

There are no gaging stations on the main river in the Kennebec River study area, except for one on Cobbosseecontee Stream. Damaging floods have been recorded on the Kennebec River as early as the year 1770 and as recent as 1969, 1970 and 1973. (See Table 3).

Flows were first recorded in 1892. Since then, a great majority of the floods occurred in the months of March, April or May and were caused by snowmelt augmented by rainfall. The magnitude of spring floods varies considerably and is dependent on the water content of the snow cover, temperature variations, and the amount of rainfall experienced during the snowmelt period. River stages during such spring floods are frequently increased at various locations by the formation of ice jams.

TABLE 3

DAMAGING FLOODS ON THE KENNEBEC RIVER

1770	January	1870	February
1826	March	1887	April
1832	May	1895	April
1839	January	1896	March
1843	April	1901	December
1846	April	1923	March
1852	April	1936	March
1855	October	1969	December
1869	October	1970	February
		1973	December

March 1936

The greatest flood on record was experienced in March 1936 when two extraordinarily heavy rainstorms occurred when there was a heavy accumulation of snow on the ground over much of the area. The water content of the snow-cover in the Kennebec River basin in early March ranged from 6.5 to 10.0 inches. This was augmented by a total of from 4.3 to 9.6 inches of rainfall during the period from 9 to 22 March. The floods, resulting from this combination of events, were unusually devastating. Records of river stages extending back to the time of the first settlement by white men were broken, many of them by a wide margin. (See Figures 1 & 2).

December 1973

From the 14th to the 22nd of December over 10 inches of rain fell in the area from Augusta to Bingham. Floodflows approached the March 1936 levels on the Kennebec River but stages were several feet lower because there were no ice jams coincident with high river stages. Major flooding occurred in the river front areas of Augusta, Hallowell and Gardiner, with minor flooding on small rivers and on the shores of many lakes and ponds where homes and cottages were situated on low shore lines. (See Figures 4, 5, & 6).

The elevations in feet above mean sea level reached during previous floods on the Kennebec River as determined from marks on a building in Hallowell (Figure 3) also are shown in Table 4.

TABLE 4

FLOOD ELEVATIONS IN HALLOWELL

Date	Elevation (feet, mean sea level)
March 1936	29.6
March 1896	26.0
February 1870	24.1
March 1826	22.2

MARCH 1936

Figure 1

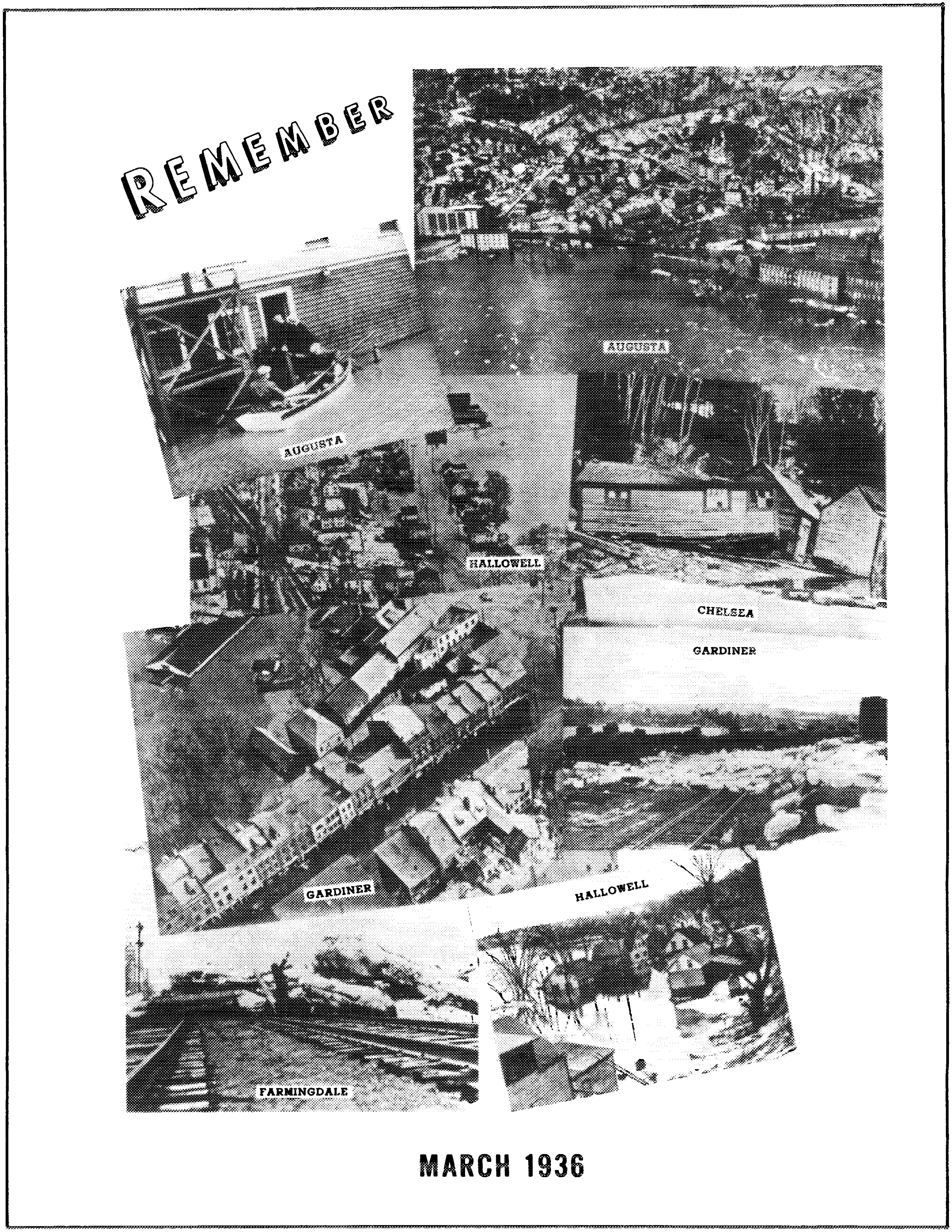

REMEMBER
AUGUSTA
AUGUSTA
HALLOWELL
CHELSEA
GARDINER
GARDINER
HALLOWELL
FARMINGDALE
MARCH 1936

Figure 2

The Kennebec River grows more angry with the passing years. Wallace R. Brann, Hallowell grocer, points to the record high water mark on the corner of his store at 136 Water Street, established on the ill-fated night of Friday, March 13, 1936. The three previous high marks are seen below. Forty-three inches below is the line of the high water mark set March 2, 1896 which held for forty years. Two feet below that is the mark of Feb. 20, 1870, engraved in granite, and at the foot of the pillar can be seen the first mark, recorded with the legend: "Height of water March 26, 1826."

Figure 3 - High Water Marks In Hallowell

Figure 4 - December 1973 Flood In Hallowell

Same Location As Above

Figure 5 - December 1973 Flood In Hallowell

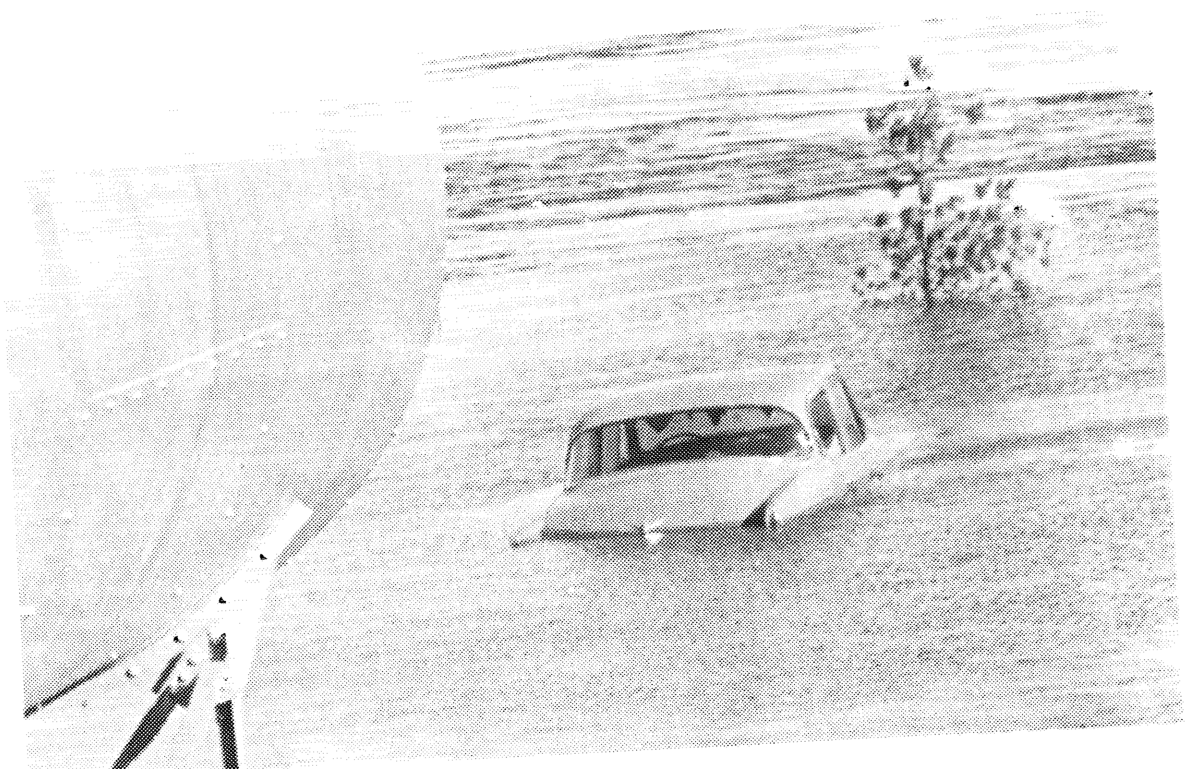


Figure 6 - December 1973 Flood In Gardiner
Parking Lot Along The Kennebec River

FUTURE FLOODS

Floods of the same or larger magnitude as those that have occurred in the past could occur in the future. Larger floods have been experienced in the past on streams with similar geographical and physiographical characteristics as those found in the study area. Similar combinations of rainfall and runoff which caused these floods could occur in the Kennebec River area. Table 3 lists damaging floods that have occurred on the Kennebec River. Discussion of the future floods in this report is limited to those that have been designated as the 100-year and 500-year frequency floods.

Flood Magnitudes and Their Frequencies

A frequency curve of peak flows was constructed on the basis of available information and computed flows of floods up to the magnitude of the 500-year flood. The frequency curve thus derived, which is available on request, reflects the judgment of engineers who have studied the area and are familiar with the region. Floods larger than the 500-year flood are possible, but the combinations of factors necessary to produce such large flows would be extremely rare.

The 100-year frequency flood is defined as a flood having an average frequency of occurrence in the order of once in 100 years, at a designated location, although the flood may occur in any year and possibly in successive years. The 100-year frequency of occurrence can be expressed in terms of percentage to avoid the possible inference of regularity of occurrence. Thus, a flood with a 100-year recurrence interval would have a one percent chance of being equalled or exceeded in any year. Perhaps more significantly, it has about a 25 percent chance of occurrence during a 30-year mortgage period.

Hazards of Large Floods

The extent of damage caused by any flood depends on the topography of the area flooded, depth and duration of flooding, velocity of flow, rate of rise, and developments in the flood plain. An 100-year or 500-year flood on the Kennebec River and tributaries would result in inundation of residential, commercial, and industrial, as well as agricultural sections in the study area. Deep flood water flowing at high velocity and carrying floating debris would create conditions hazardous to persons and vehicles attempting to cross flooded areas. In general, floodwater three or more feet deep and flowing at a velocity of three or more feet per second could easily sweep an adult person off his feet, thus creating definite danger of injury or drowning. Rapidly rising and swiftly flowing floodwater may trap persons in homes that are ultimately destroyed, or in vehicles that are ultimately submerged or floated. Water lines can be ruptured by deposits of debris and the force of floodwaters, thus creating the possibility of contaminated domestic water supplies. Damaged sanitary sewer lines and sewage treatment plants could result in the pollution of floodwaters creating health hazards. Isolation of areas by floodwater could create hazards in terms of medical, fire, or law enforcement emergencies.

Obstructions

Brush and debris washing downstream during floods often collect against bridges or within any restricted flow area, reducing the waterway openings and otherwise impeding flood flow. This creates a damming effect and, depending upon the degree of clogging, causes greater backwater depths with increased overbank flooding. Water pressure, building against embankments and bridges, can then result in serious erosion, stress damage, or total destruction of the structure involved.

A pronounced increase in flow velocities usually occurs downstream from an obstruction, thus extending the flood's damage potential. Obstructive new development and future land filling in or near the rivers' floodways can be a major factor in multiplying the adverse effects described.

Flood crests for the 100-year flood and the 500-year flood and pertinent elevations at bridge crossings within the study area are listed in Table 5. For study purposes herein, it has been assumed that no clogging would occur and all bridge structures would stand intact. Significant changes in this premise, imposed by differing conditions of a future flood, could alter the estimated flood crests and flood limits shown in the table and related plates.

TABLE 5

ELEVATION DATA -- BRIDGES

Location	Miles	100 Year D/S	100 Year U/S	500 Year D/S	500 Year U/S
		(feet mean sea level)			
KENNEBEC RIVER					
Richmond Highway	26.4	19.4	19.9	25.5	26.3
Gardiner Highway	36.8	28.0	28.9	34.8	35.7
Memorial	42.8	34.1	35.0	41.4	42.8
Curran	43.1	35.4	35.9	43.2	44.2
Maine Central Railroad	43.3	36.0	36.5	44.3	45.0

GUIDELINES FOR FLOOD PLAIN MANAGEMENT

Man has been building on and occupying the flood plains of rivers and streams since the arrival of pioneer settlers. The streams first provided transportation and water supply and later their gentle valley grades encouraged the construction of highways and railroads. Today, uncontrolled growth of cities often results in unwise encroachment on the flood plains of local streams.

Through bitter experience, man has learned that floods periodically inundate portions of the flood plain, damaging property and often causing loss of life. This experience has led to a relatively new approach for reducing flood damages. Called "flood plain management", this approach consists of applying controls over the use of land lying adjacent to streams. Planned development and management of flood hazard areas can be accomplished by a variety of means.

Interpretation of Data

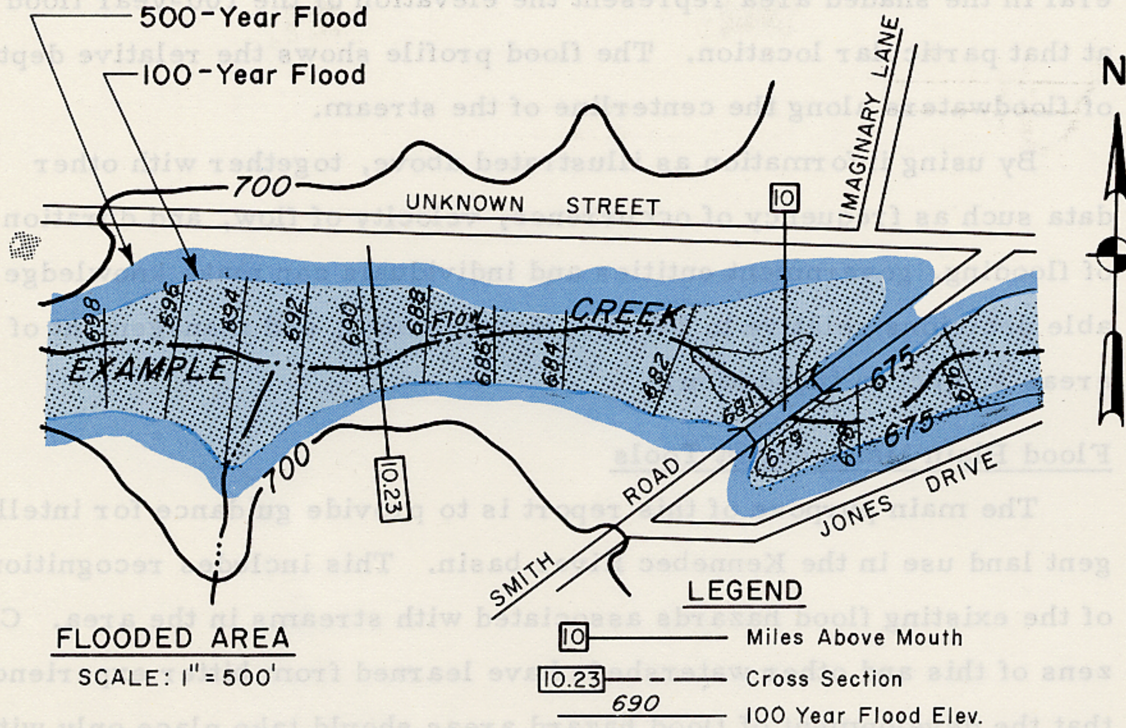
Flooded area maps and profiles are provided in this report to define the limits of flooding that would occur during a 100-year flood and a 500-year flood.

The areas that would be inundated by the 100- and 500-year floods are shown on Plates 3, 6, 9 and 12. The computed water surface elevations for these floods and high water mark elevations are shown on Plates 4, 5, 7, 8, 10, 11, 13 and 14. The actual limits of these overflow areas on the ground will vary from those shown because the scales of the available maps do not permit precise plotting of the flooded area boundaries. Important land use decisions in specific areas should be verified by field surveys. Changes in the land use, drainage patterns, and structural occupancy of the flood plain may result in higher flood elevations than those shown.

Hypothetical examples of the maps, profiles, shown on Figure 7, page 15, depict the areal limits and elevations of the respective floods at imaginary locations.

The lateral limits of flooding from the 100-year flood are shown by the light shaded area, while the darker area indicates the additional

HYPOTHETICAL FLOOD PLAIN INFORMATION



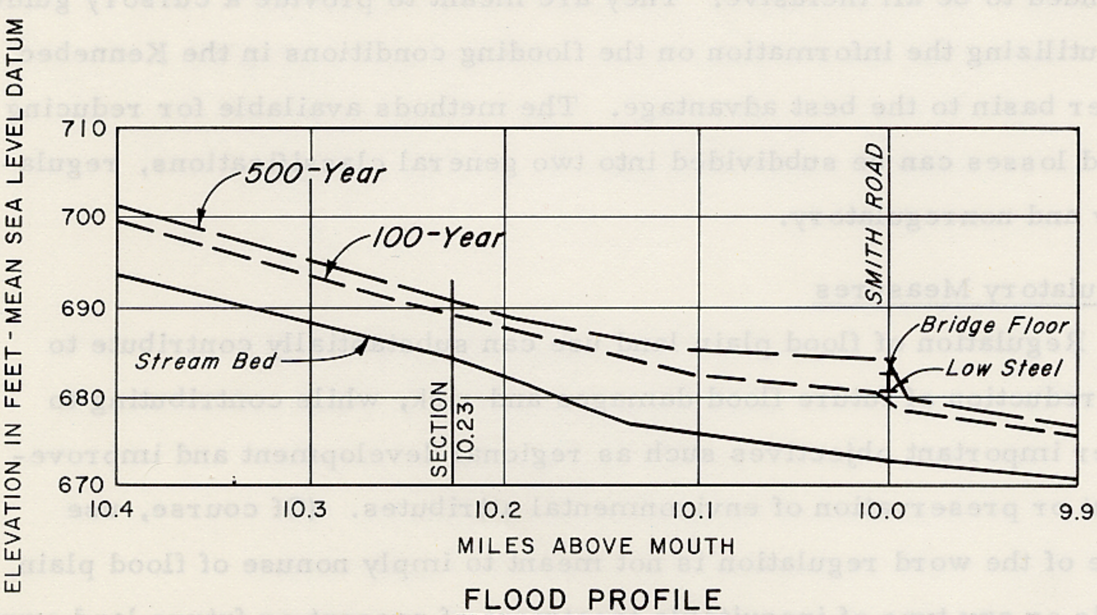


FIGURE 7

land that would be inundated by the 500-year flood. The line and numeral in the shaded area represent the elevation of the 100-year flood at that particular location. The flood profile shows the relative depth of floodwaters along the centerline of the stream.

By using information as illustrated above, together with other data such as frequency of occurrence, velocity of flow, and duration of flooding, government entities and individuals can make knowledgeable decisions relative to the use, development, and management of areas subject to inundation.

Flood Plain Management Tools

The main purpose of this report is to provide guidance for intelligent land use in the Kennebec River basin. This includes recognition of the existing flood hazards associated with streams in the area. Citizens of this and other watersheds have learned from bitter experience that the development of flood hazard areas should take place only with full knowledge of the risk and social cost involved. The following remarks concerning possible uses for the data presented herein are not intended to be all inclusive. They are meant to provide a cursory guide for utilizing the information on the flooding conditions in the Kennebec River basin to the best advantage. The methods available for reducing flood losses can be subdivided into two general classifications, regulatory and nonregulatory.

Regulatory Measures

Regulation of flood plain land use can substantially contribute to the reduction of future flood damages and risk, while contributing to other important objectives such as regional development and improvement or preservation of environmental attributes. (Of course, use here of the word regulation is not meant to imply nonuse of flood plain lands or any type of inequitable treatment of present or future land owners).

Federal agencies do not have the authority to regulate flood plain development. This authority was assigned to the states (and their political subdivisions) in the tenth amendment to the U. S. Constitution and has never been delegated to the Federal Government. Consequently, it is local governmental bodies utilizing available state legislation that have to assume the day to day responsibility for guiding development in flood prone areas.

The principal regulatory devices used at local governmental levels include zoning ordinances, subdivision regulations, and building and health codes. The following is a discussion of these four types of regulations.

a. Subdivision control ordinances may also be effective tools for flood plain building control. Subdivision control relates to the way in which land is divided and made ready for building development. For example, a city may control the subdivision of land within its jurisdiction by requiring that a large percentage of the minimum lot area of a subdivision be a designated height above an adopted floodwater elevation as a requisite for plat approval. Unlike zoning ordinances which extend only to a city's limits, cities have some control over subdivision development in areas within their extraterritorial jurisdiction.

b. Building codes set forth standards of construction for the purposes of protecting health, safety and general welfare of the public. Building codes may be written to set minimum standards for water (flood) proofing of structures, for establishing minimum first floor elevations consistent with potential flood occurrences, and requirements for material strength and proper anchorage.

c. Flood plain zoning ordinances are usually "superimposed" on existing zoning ordinances. They may be used to implement broader land use plans and to reduce future flood losses by stipulating the type of building development permitted in flood prone areas. They can also be used to limit flood plain development by establishing flood plain encroachment limits. These regulations should exclude obstructions from floodway areas which adversely affect flood heights and allocate the flood plain to uses consistent with the degree of the flood threat. Floodways can be established along modified (enlarged, straightened) or natural stream channels. See the GLOSSARY OF TERMS for a definition of the terms floodway and encroachment limits. The floodway and encroachment limit concepts are also illustrated on Figure 8, page 19.

d. Health codes can serve as a control over the use of flood plains for waste disposal and the construction of water and sewage treatment facilities that may create health problems during floods.

Nonregulatory Measures

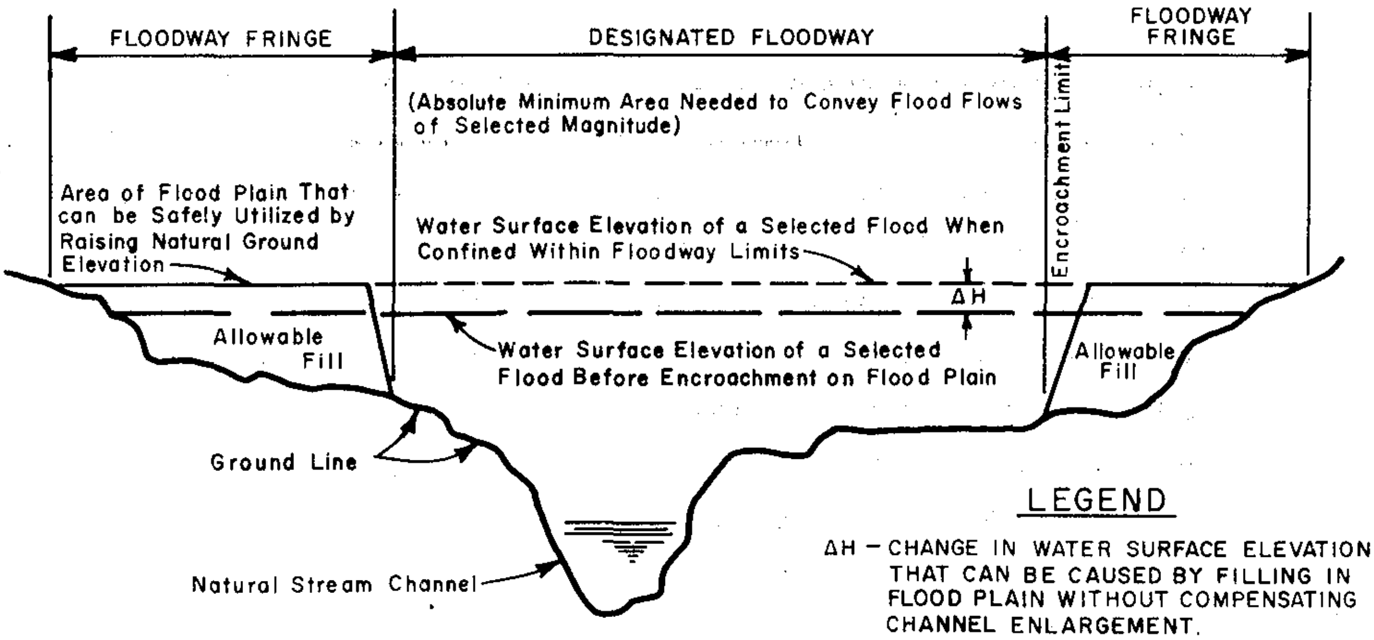
Other methods that can be used to reduce flood damage losses include:

a. Structural measures can be used to reduce flood heights (channel modifications, dams) or provide a barrier between floodwaters and development (levees, dikes).

b. Fee purchase of lands for open space uses. -- Many grant and loan programs are available to local governments through the Department of Housing and Urban Development and other federal agencies for preserving flood plain lands as green belts, development of these areas for parks, nature trails, etc.

c. Acquisition of flooding easements. -- Purchase of less than fee interest in flood prone land is another approach to controlling development.

d. Flood proofing by elevating structures, water proofing, or filling of low areas for building sites. -- Some buildings can be raised



FLOODWAY FRINGE

Suggested Uses

Uses permitted in the floodway area. Residential, Commercial, Industrial, Public & other development with floodwater entry points at or above design elevation for encroachment.

Uses Not Appropriate

Hospitals & Nursing Homes
Boarding Schools & Orphanages
Sanitariums
Detention Facilities
Refuge Centers
Permanent Storage of Materials or Equipment (Emergency Equipment)

FLOODWAY AREA

Suggested Uses

Farms, Truck Gardens & Nurseries
Livestock & Other Agricultural Uses.
Non-obstructive Structures
Parking Lots, Playgrounds & Parks
Golf Course & Open Recreation
Preserves & Reservations.

Uses Not Appropriate

Land Fills & Obstructive Structures
Floatable Storage
Disposal of Garbage
Rubbish, Trash or Offal
All uses precluded from floodway fringe area.

FIGURE 8 — FLOOD PLAIN CROSS SECTION SHOWING FLOODWAY & ENCROACHMENT LIMIT CONCEPTS

in place up to a reasonable limit to reduce flood damages. Other structures can be made to withstand flood velocities and depths through the use of bulkheads, watertight openings, flotation anchors, plumbing cutoff valves, and structural reinforcements. Structures can be built in flood plain fringe areas at elevations above a selected flood magnitude. However, this should be done only in connection with an established floodway width or encroachment limits to eliminate obstructions that would raise upstream flood stages.

e. Flood insurance can now be made available through the Department of Housing and Urban Development to cities that adopt appropriate flood plain regulations. Flood insurance does not reduce flooding or flood caused damages, but reduces the risk of large economic losses by individual flood victims.

f. Development policies in regard to extending public services. -- "Flood conscious" governmental policies that limit or discourage the extension of public roads, utilities, and other services into flood prone areas can play an important role in encouraging prudent flood plain use. Private developments usually depend on the extension of public services. By avoiding the extension of such services into flood hazard areas, local government and private utility companies can encourage ~~the~~ occupancy of safer, and, in the long run, cheaper flood free areas.

Very little building is carried on without outside financing. Therefore, lending institutions, both federal and private, are in a position to exercise control over flood plain development by denying mortgage guarantees or funds to subdivision or individual builders for projects that will eventually become "flood problems".

GLOSSARY OF TERMS

DISCHARGE. As applied to a stream, the rate of flow, or volume of water flowing in a given stream at a given place and within a given period of time, usually quoted in cubic feet per second (cfs) or gallons per minute (gpm).

DRAINAGE AREA. The area tributary to a lake, stream, sewer, or drain. Also called catchment area, watershed, and river basin.

ENCROACHMENT LIMITS. A limit of obstruction to flood flows. Encroachment limits are normally established on the ground through the use of markers. These encroachment "lines" are roughly parallel to a stream on each bank. Encroachment lines are established by assuming that the area landward (outside) of the lines will be ultimately developed in such a way that it will not be available to convey flood flows.

FLOOD. An overflow of water onto lands not normally covered by water and that are used or usable by man. Floods have two essential characteristics: The inundation of land is temporary; and the land is adjacent to and inundated by overflow from a river or stream or an ocean, lake, or other body of standing water.

Normally, a "flood" is considered as any temporary rise in streamflow or stage, but not the ponding of surface water, that results in significant adverse effects in the vicinity. Adverse effects may include damages from overflow of land areas, temporary backwater effects in sewers and local drainage channels, creation of unsanitary conditions or other unfavorable situations by deposition of materials in stream channels during flood recessions, rise of ground water coincident with increased streamflow and other problems.

FLOOD PEAK. The maximum instantaneous discharge of a flood at a given location. It usually occurs at or near the time of the flood crest.

FLOOD PLAIN. The relatively flat area or low lands adjoining the channel of a river, stream or watercourse or ocean, lake or other body of standing water, which has been or may be covered by flood water.

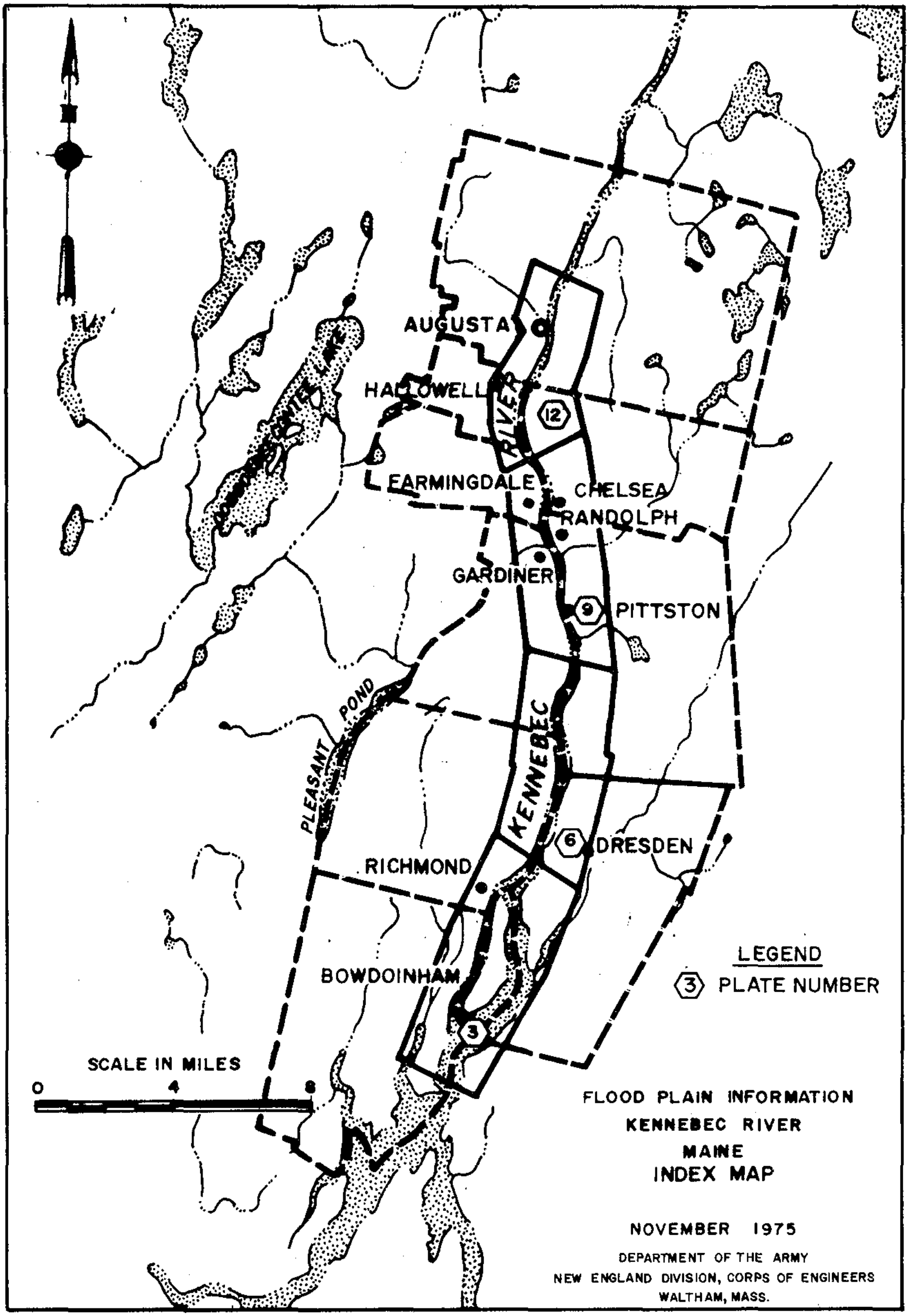
FLOOD PROFILE. A graph showing the relationship of water surface elevation to location, the latter generally expressed as distance above mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditions at a given time or stage.

FLOODWAY. The minimum area of a flood plain required to convey a flood peak of a selected magnitude. This usually consists of the most hazardous area of the flood plain where water velocities are appreciable. Areas on the landward side of a floodway normally convey little or no flood flow although they are inundated by water during floods.

MEAN SEA LEVEL. A determination of mean sea level that has been adopted as a standard datum for heights. Elevation in feet and decimals thereof is a measurement vertically above the datum as used in surveys and engineering reports.

ONE HUNDRED YEAR FLOOD. A flood having an average frequency of occurrence in the order of once in 100 years, at a designated location, although the flood may occur in any year and possibly in successive years. It would have a one percent chance of occurrence in any year. In the past, this flood has been referred to as the Intermediate Regional Flood.

WATERSHED. (1) the area contained within a divide above a specified point on a stream; (2) the divide between drainage basins.

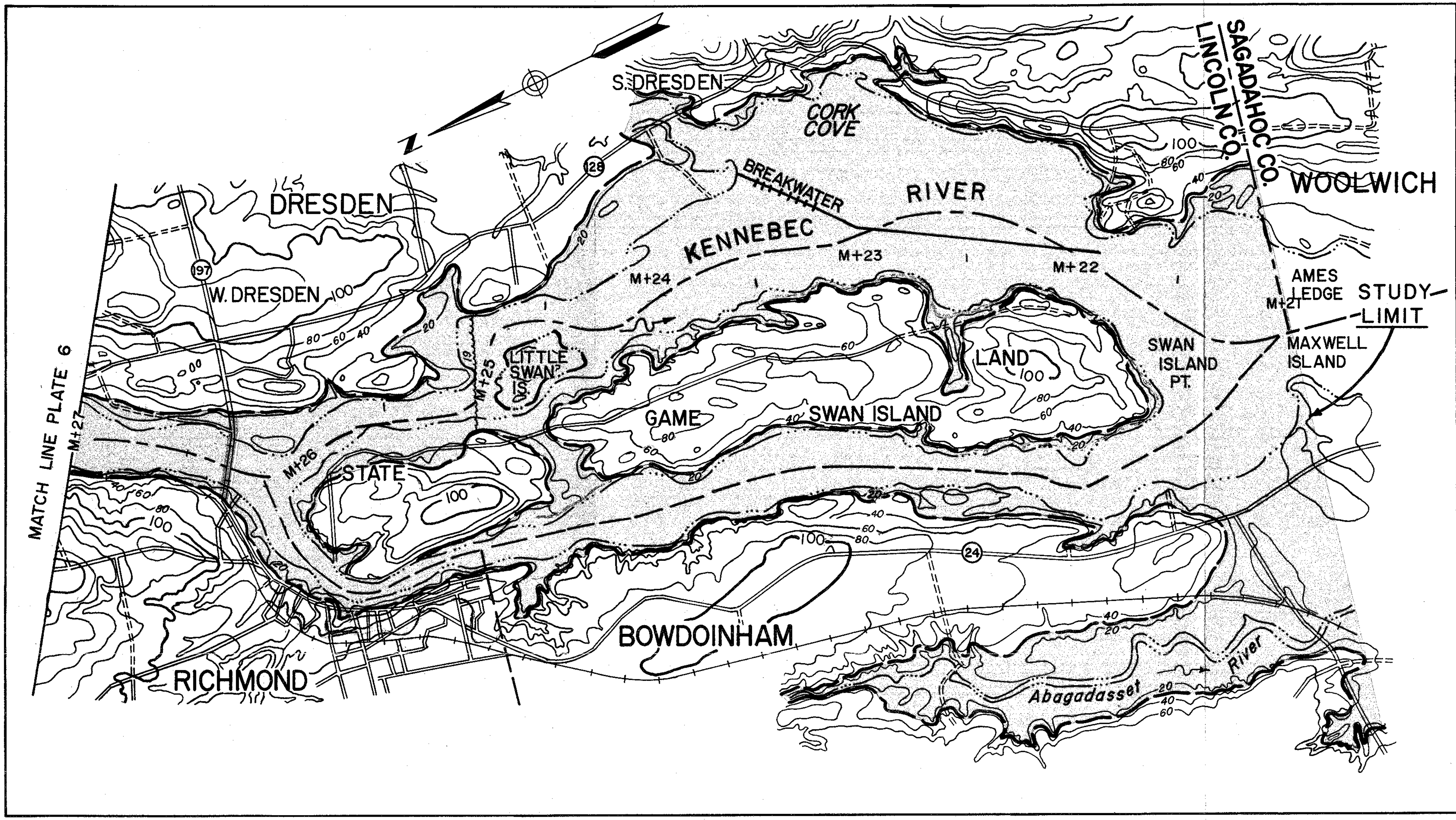


FLOOD PLAIN INFORMATION
KENNEBEC RIVER
MAINE
INDEX MAP

NOVEMBER 1975

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

PLATE 2



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD (500 YEAR FLOOD WILL COVER APPROXIMATELY THE SAME AREA)

M+22 MILE ABOVE THE MOUTH OF KENNEBEC RIVER

100 GROUND ELEVATION IN FEET (U.S.C. & G.S.) SEA LEVEL DATUM

19 100 YEAR FLOOD ELEVATION

(128) STATE ROUTE

CHANNEL

NOTES

1. MAP BASED ON U.S.G.S. QUADRANGLE SHEETS GARDINER, MAINE 1957 AND AUGUSTA, MAINE 1956.
2. LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
3. AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.
4. MINIMUM CONTOUR INTERVAL IS 20 FEET.

SCALE IN MILES

0 0.4 0.8

FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PLAN

MILE 21 TO MILE 27

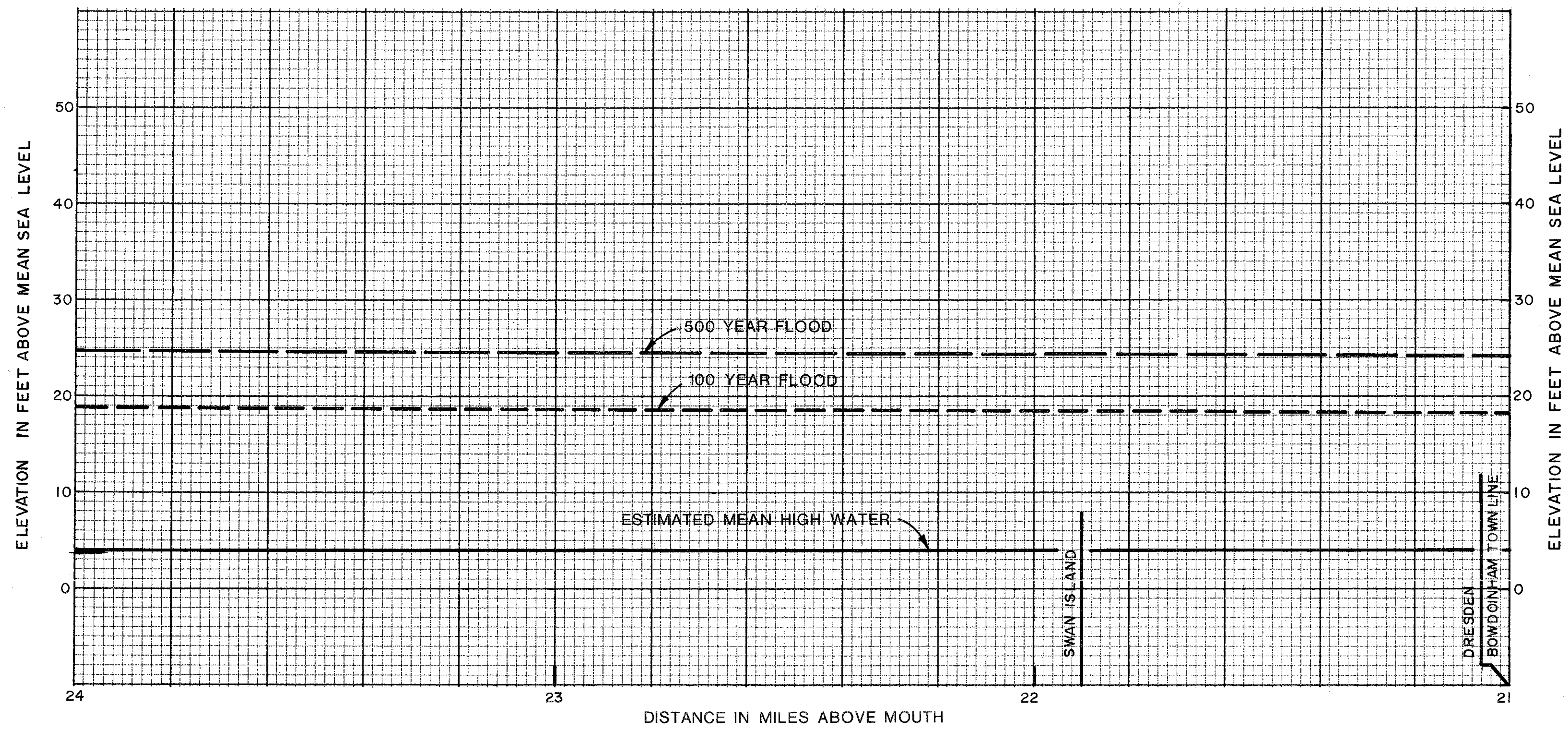
NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.

PLATE 3



FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PROFILES

MILE 21 TO MILE 24

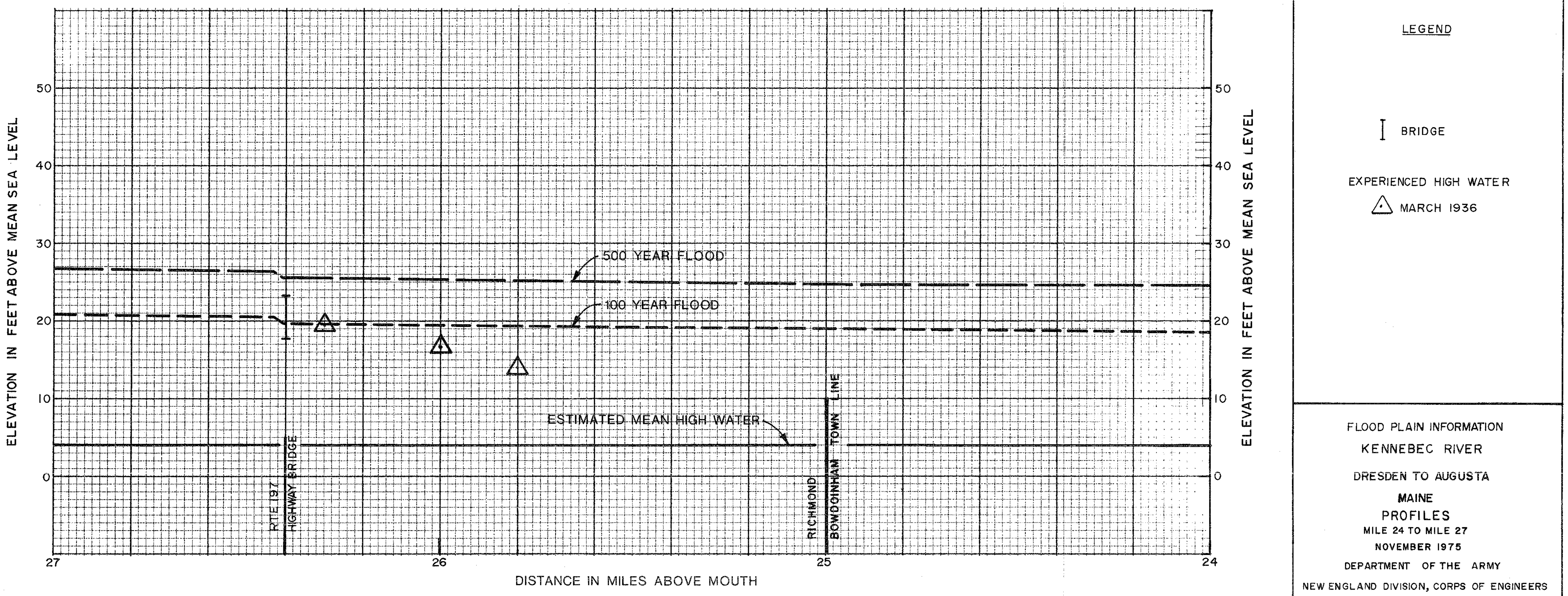
NOVEMBER 1975

DEPARTMENT OF THE ARMY

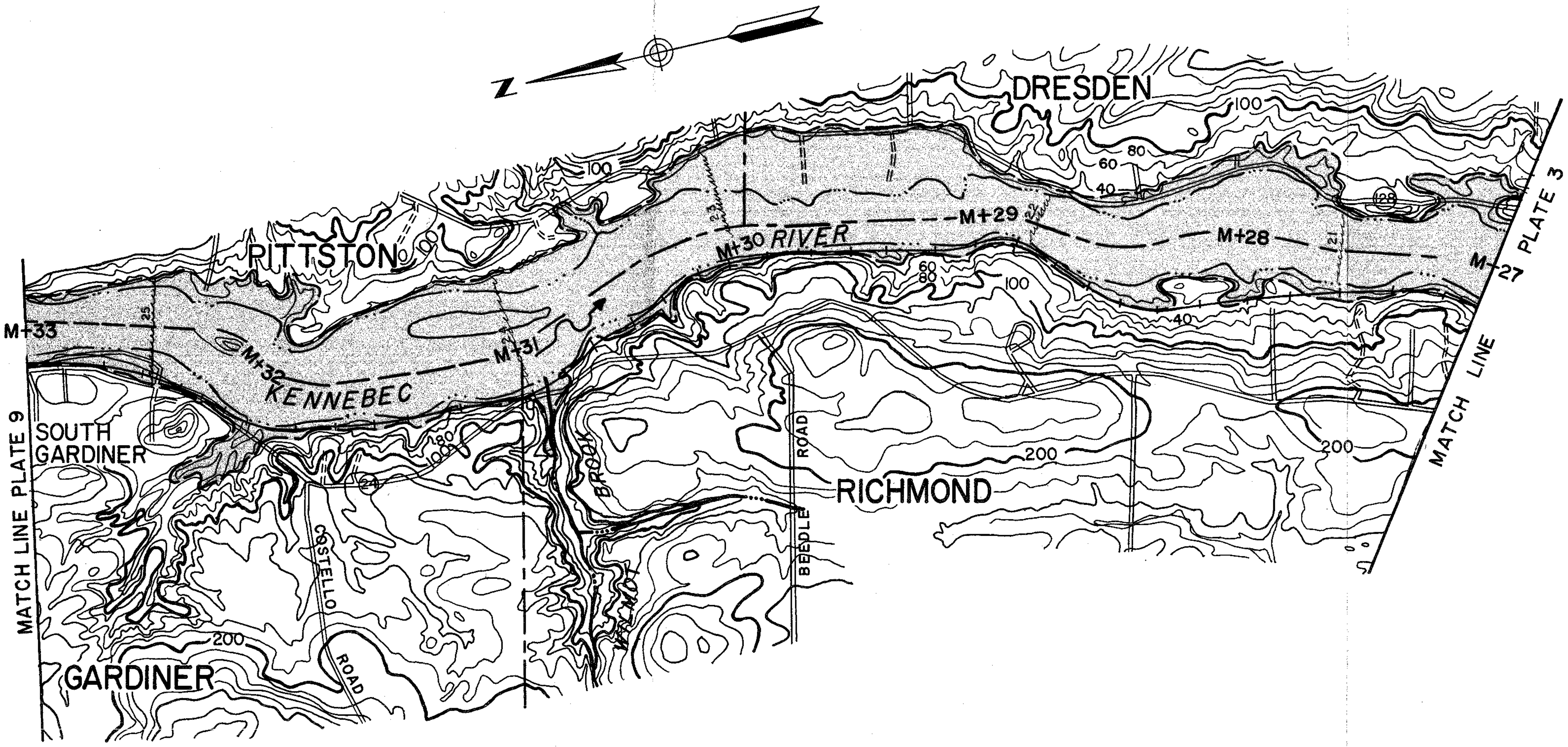
NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.

PLATE 4



FLOOD PLAIN INFORMATION
KENNEBEC RIVER
DRESDEN TO AUGUSTA
MAINE
PROFILES
MILE 24 TO MILE 27
NOVEMBER 1975
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD (500 YEAR FLOOD WILL COVER APPROXIMATELY THE SAME AREA)

M+28 MILE ABOVE THE MOUTH OF KENNEBEC RIVER

~100~ GROUND ELEVATION IN FEET (U.S.C. & G.S.) SEA LEVEL DATUM

22 100 YEAR FLOOD ELEVATION

(24) STATE ROUTE

CHANNEL

NOTES

1. MAP BASED ON U.S.G.S. QUADRANGLE SHEETS GARDINER, MAINE 1957 AND AUGUSTA, MAINE 1956.
2. LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
3. AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.
4. MINIMUM CONTOUR INTERVAL IS 20 FEET.

SCALE IN MILES

0 0.4 0.8

FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PLAN

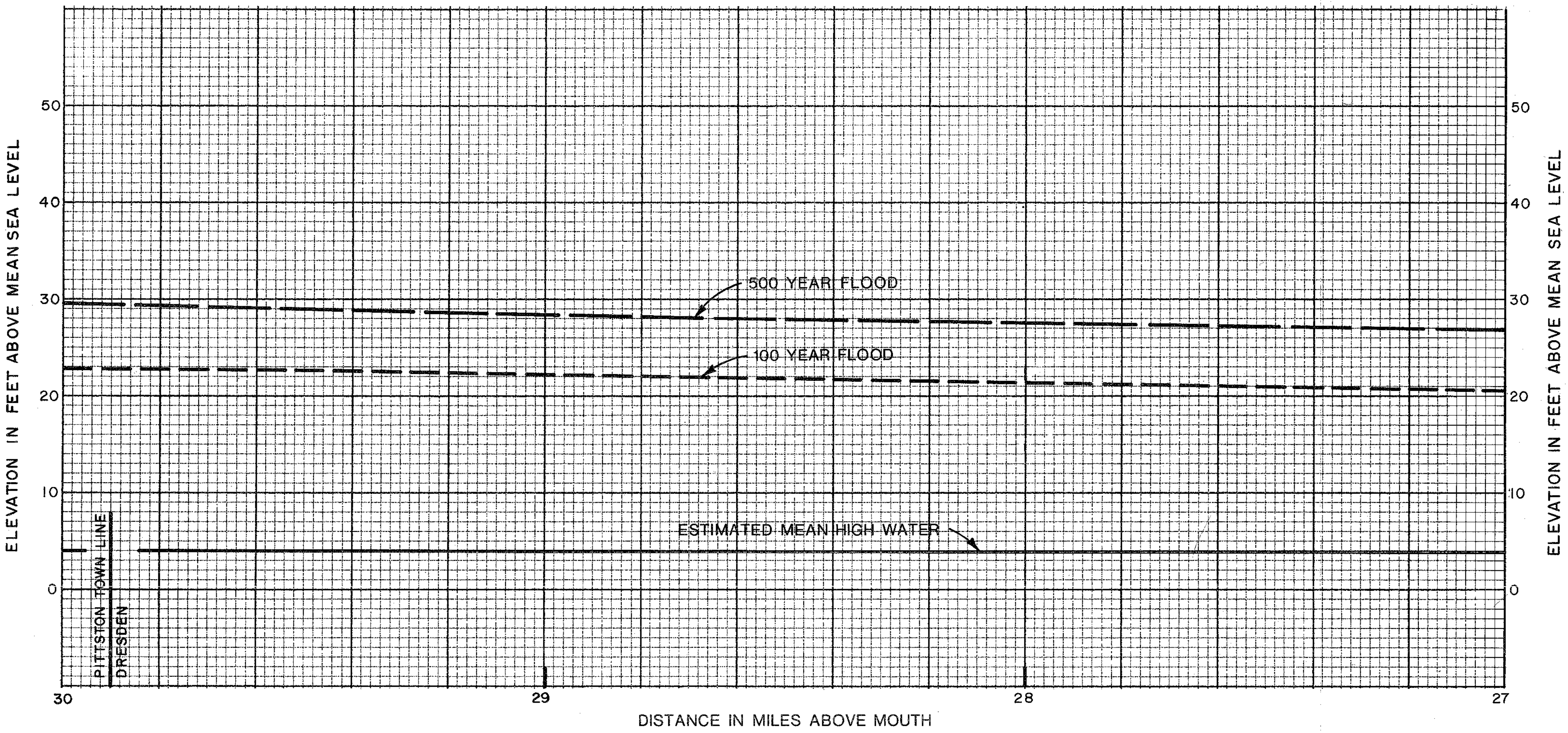
MILE 27 TO MILE 33

NOVEMBER 1975

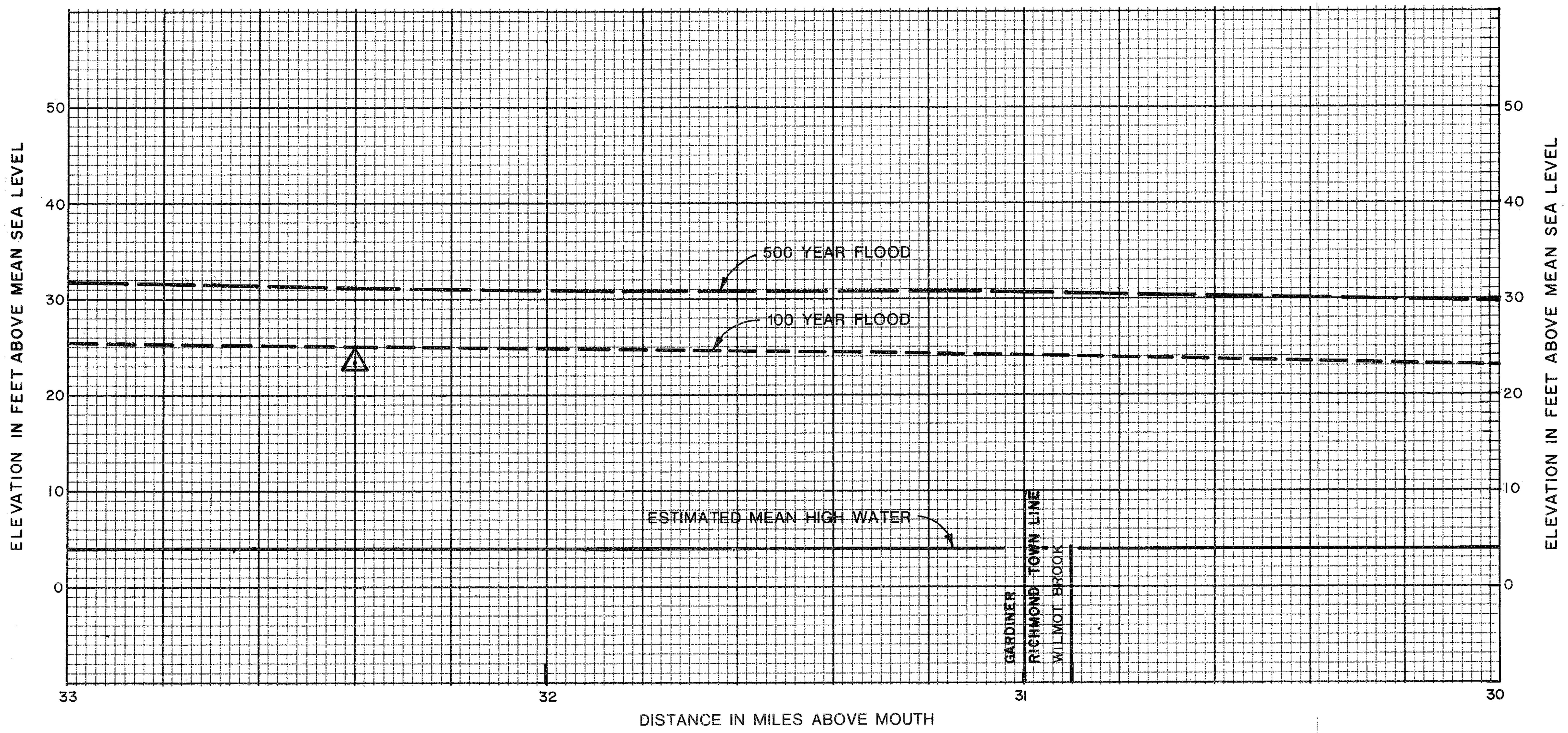
DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.



FLOOD PLAIN INFORMATION
KENNEBEC RIVER
DRESDEN TO AUGUSTA
MAINE
PROFILES
MILE 27 TO MILE 30
NOVEMBER 1975
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS



LEGEND

EXPERIENCED HIGH WATER

△ MARCH 1936

FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PROFILES

MILE 30 TO MILE 33

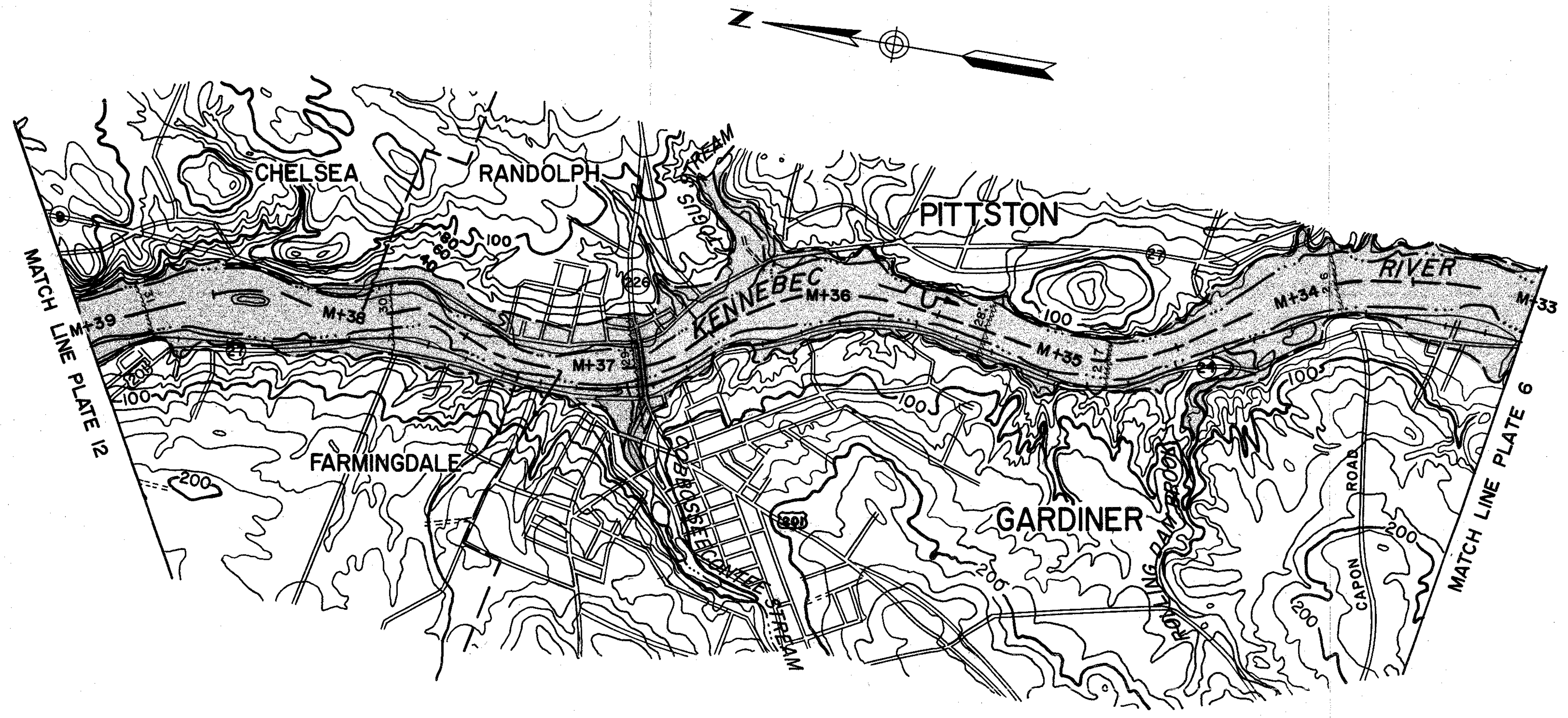
NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.

PLATE 8



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD (500 YEAR FLOOD WILL COVER APPROXIMATELY THE SAME AREA)

M+34 MILE ABOVE THE MOUTH OF KENNEBEC RIVER

~100~ GROUND ELEVATION IN FEET (U.S.C. & G.S.) SEA LEVEL DATUM

27 100 YEAR FLOOD ELEVATION

(27) STATE ROUTE

CHANNEL

201 U.S. ROUTE

NOTES

1. MAP BASED ON U.S.G.S. QUADRANGLE SHEETS GARDINER, MAINE 1957 AND AUGUSTA, MAINE 1956.
2. LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
3. AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.
4. MINIMUM CONTOUR INTERVAL IS 20 FEET.

SCALE IN MILES

0 0.4 0.8

FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PLAN

MILE 33 TO MILE 39

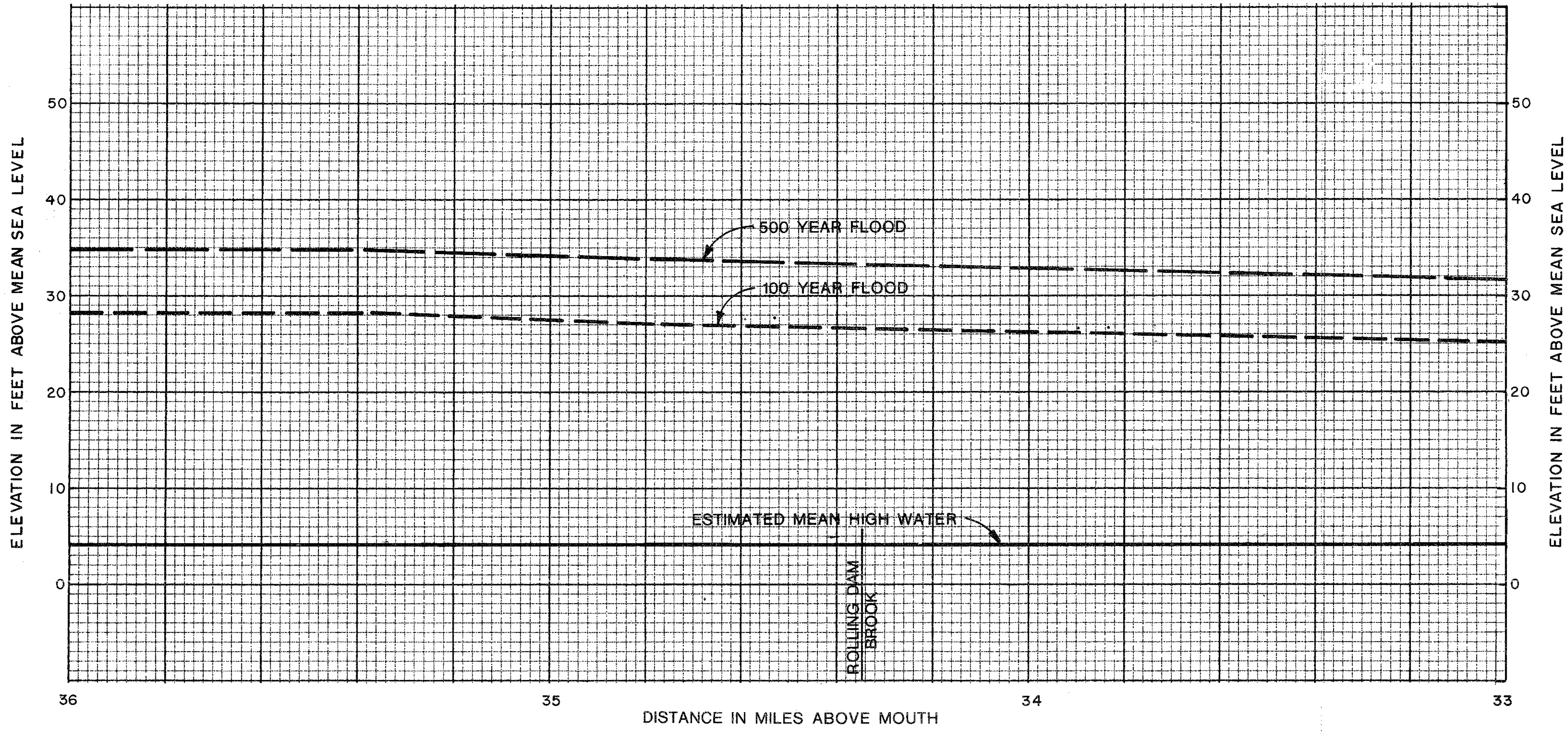
NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.

PLATE 9



FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PROFILES

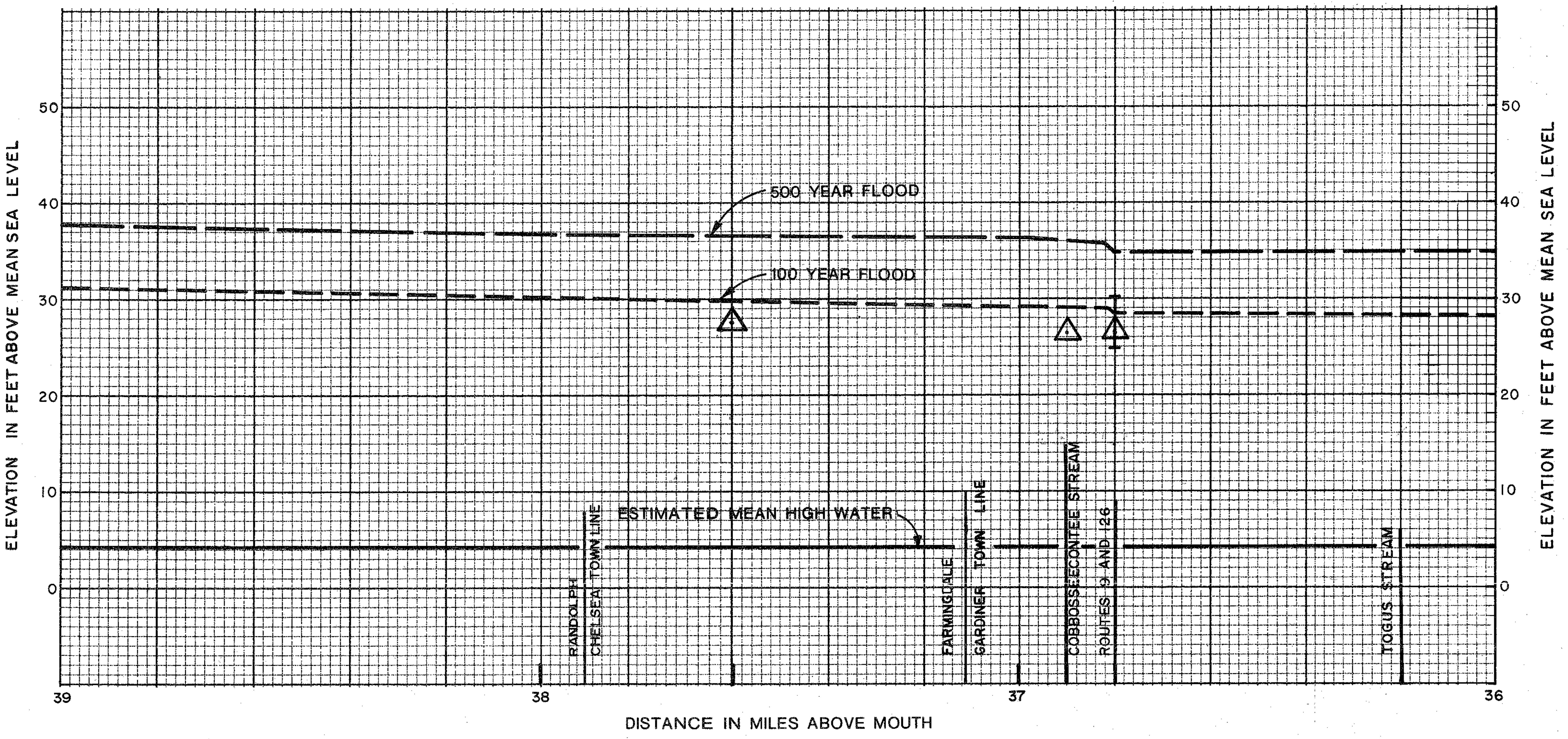
MILE 33 TO MILE 36

NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.



LEGEND

BRIDGE

EXPERIENCED HIGH WATER

MARCH 1936

FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PROFILES

MILE 36 TO MILE 39

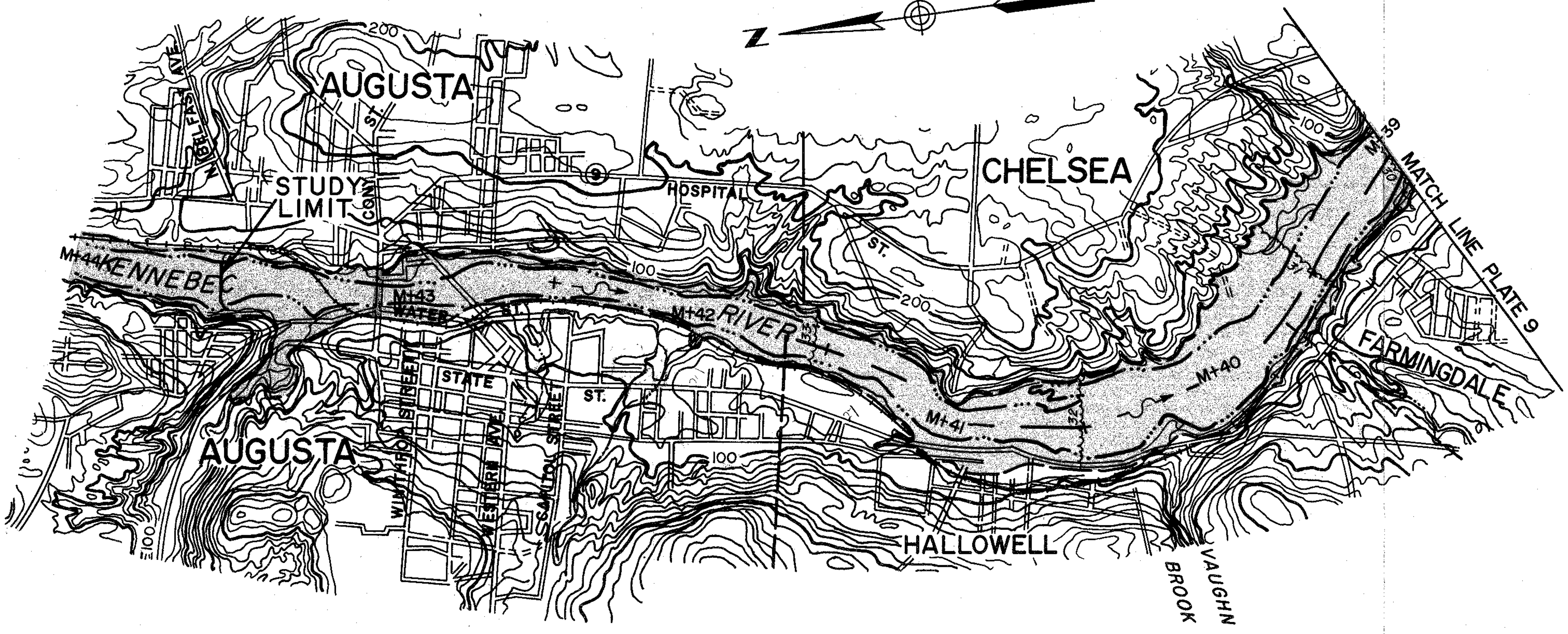
NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.

PLATE II



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD (500 YEAR FLOOD WILL COVER APPROXIMATELY THE SAME AREA)

M+41 MILE ABOVE THE MOUTH OF KENNEBEC RIVER

~100~ GROUND ELEVATION IN FEET (U.S.C. & G.S.) SEA LEVEL DATUM

31 INTERMEDIATE REGIONAL FLOOD ELEVATION

9 STATE ROUTE

201 U.S. ROUTE

CHANNEL

NOTES

1. MAP BASED ON U.S.G.S. QUADRANGLE SHEETS GARDINER, MAINE 1957 AND AUGUSTA, MAINE 1956.
2. LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
3. AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.
4. MINIMUM CONTOUR INTERVAL IS 20 FEET.

SCALE IN MILES

0 0.4 0.8

FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PLAN

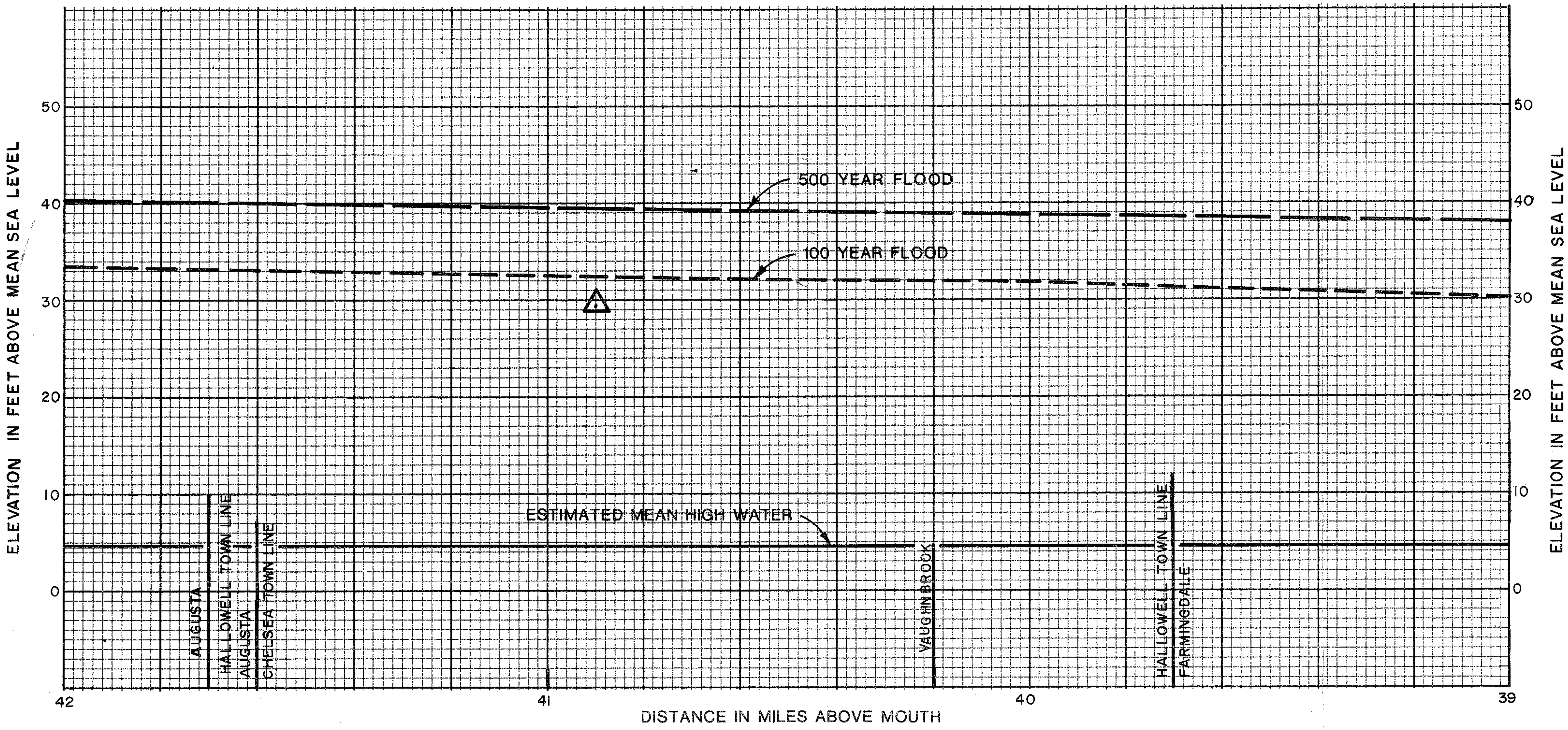
MILE 39 TO MILE 44

NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.



LEGEND

EXPERIENCED HIGH WATER

△ MARCH 1936

FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PROFILES

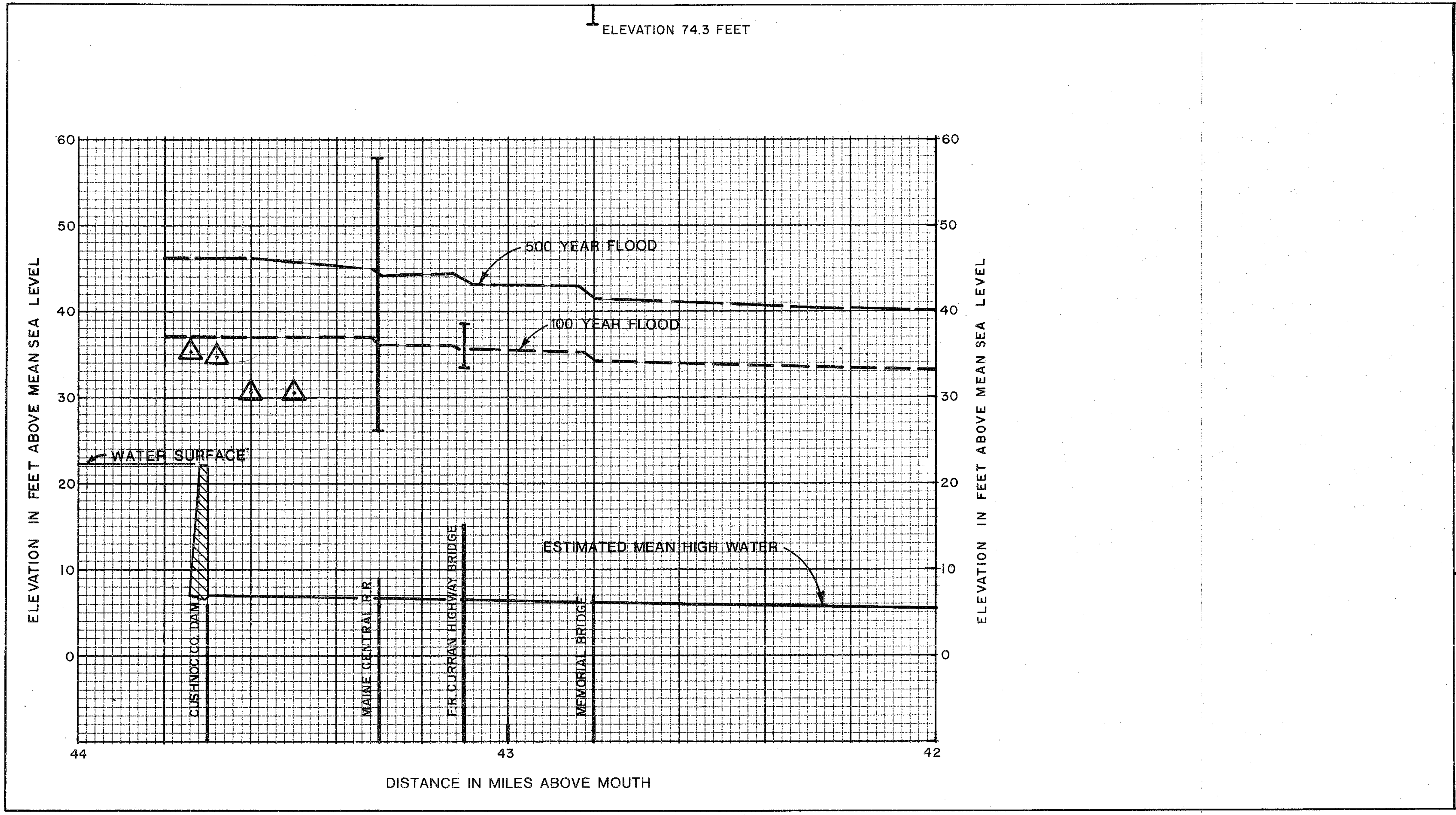
MILE 39 TO MILE 42

NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.



FLOOD PLAIN INFORMATION

KENNEBEC RIVER

DRESDEN TO AUGUSTA

MAINE

PROFILES

MILE 42 TO MILE 44

NOVEMBER 1975

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS.

PLATE 14